

*Johanson*

# Ceramic Trimmer Capacitors







# Ceramic Trimmer Capacitors

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# Johanson PATHWAY

Our vision is to continue as an outstanding, environmentally conscious American supplier providing distinctive quality products through premier service to a global market in concert with our customers' needs.

Johanson pledges to present a product of impeccable quality backed with our guarantee of unparalleled service. As a family oriented business, we value a strong and determined work ethic.

The company name, Johanson, stands for excellence and integrity. Our pledge to quality performance is a continuous effort to meet the challenge of our vision.



# Cera-Trim II™

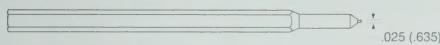
## Trimmer Capacitors

The 2400 series trimmer capacitors are extremely durable single turn surface mount devices that are available in a wide range of capacitance values. A high Q over a broad frequency range combined with good temperature stability are the characteristics found with this unique ceramic package.

### Characteristics

- Rated voltage: 250 VDC (test voltage 500 VDC)
- Insulation resistance:  $>10^4$  meg $\Omega$
- Operating temperature range:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Torque: 0.05 to 1.0 oz. in.
- Vibration: 15 g, 10-2000 Hz
- Shock: 100 g, 6 milliseconds
- Setting drift: <1%
- Moisture resistance: MIL-STD-202, Method 106
- Resistant to soldering temperatures and fluxes
- Washable construction

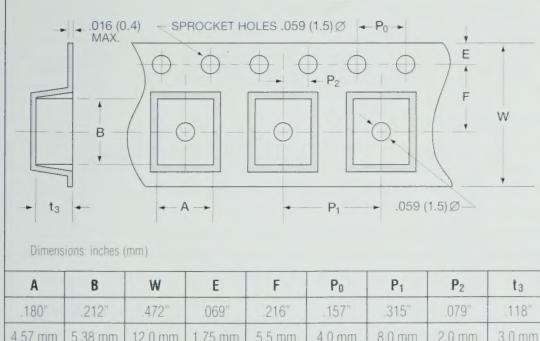
JMC Square Drive Tuning Tool 4192



### Packaging

Johanson standard bulk packaging is supplied in quantities of 500 per sealed antistatic plastic bag. Standard tape and reel packaging is available in quantities of 500 or 2,500 pieces per reel.

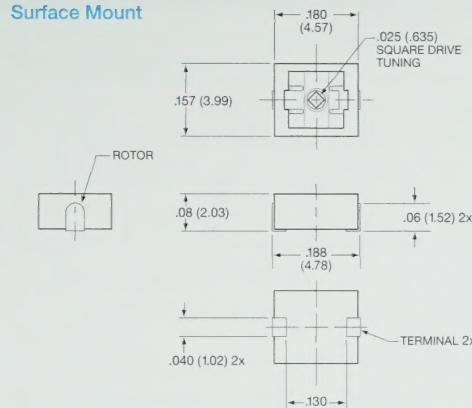
### Carrier Tape Dimensions



Add suffix to JMC P/N for reel packaging: R1 = 500 pieces R2 = 2500 pieces



### Surface Mount



### Specifications

JMC P/N	RANGE pF	TC PPM/°C	MIN. Q @ 200 MHz
2400-0	0.7 to 2.0	100 $\pm$ 200	2000
2400-1	1.5 to 4.0	NPO $\pm$ 200	1000
2400-2	3.0 to 9.0	200 $\pm$ 200	500
2400-3	4.0 to 13.0	-300 $\pm$ 300	400

### Prototyping Kit

JMC KIT JK-024	QUANTITY	RANGE pF
2400-0	4	0.7 to 2.0
2400-1	4	1.5 to 4.0
2400-2	4	3.0 to 9.0
2400-3	4	4.0 to 13
4192	1	Tuning Tool
	1	12mm Tape Sample

# Cera-Trim®

## Trimmer Capacitors

Cera-Trim® is a high performance surface mount trimmer capacitor designed specifically to withstand harsh environments. These capacitors deliver exceptional performance through microwave frequencies at operating temperatures of  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ . The square drive tuning mechanism provides and assures complete compatibility with automated tuning devices for positive non-slip tamper-proof adjustments.

The Cera-Trim® design makes it possible to utilize tape and reel. The alumina housing provides mechanical strength with outstanding electrical and heat resistant properties. The rugged construction renders it resistant to penetration of solder fluxes and cleaning solvents. Recommended handling instructions outlining soldering procedures are available in Johanson specification R-360.

The standard terminal units are available with or without top seal. The SL products are offered as sealed units only.

### Characteristics

- Rated voltage: 250 VDC (test voltage 500 VDC)
- Insulation resistance:  $>10^4$  meg $\Omega$
- Operating temperature range:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Vibration: 15 g, 10-2000 Hz, MIL-STD-202, Method 204, Condition B
- Shock: 100 g, 6 milliseconds, MIL-STD-202, Method 213, Condition I
- Moisture resistance: MIL-STD-202, Method 208
- Resistant to soldering heat and flux:  $235^{\circ}\text{C}$  for 30 seconds
- Solderability: MIL-STD-202, Method 208
- Withstands up to 5 minutes total immersion in typical cleaning solvents at room temperature
- Conforms with specification MIL-C-81

JMC Square Drive Tuning Tool 4192

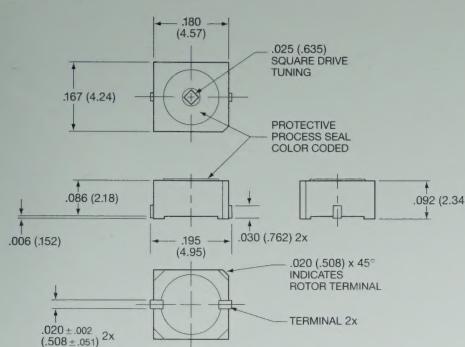
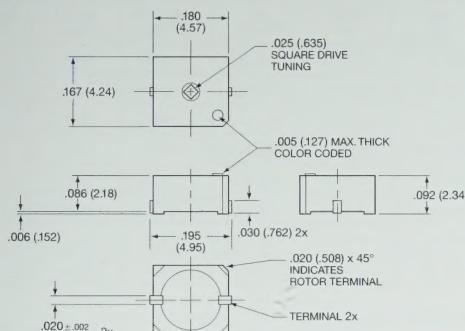
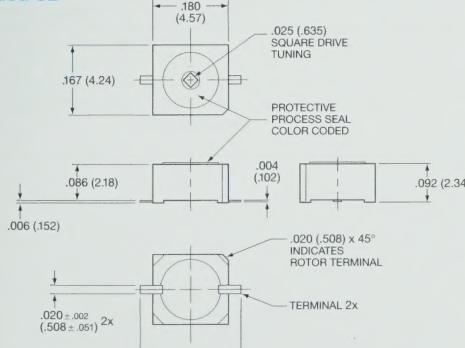


### Specifications

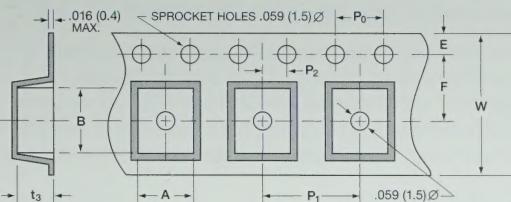
JMC P/N	RANGE pF	TC PPM/ $^{\circ}\text{C}$	MIN. Q @ 100 MHz	COLOR CODE	DRAWING FIGURE
2320-0	0.6 to 2.5	$100 \pm 200$	3000	Red	A
2320-0SL	0.6 to 2.5	$100 \pm 200$	3000	Red	C
2320-1	1.0 to 5.0	$100 \pm 200$	1000	Black	A
2320-1SL	1.0 to 5.0	$100 \pm 200$	1000	Black	C
2320-2	2.5 to 10.0	$100 \pm 200$	1000	Blue	A
2320-2SL	2.5 to 10.0	$100 \pm 200$	1000	Blue	C
2320-3	5.0 to 18.0	$-450 \pm 300$	500	Green	A
2320-3SL	5.0 to 18.0	$-450 \pm 300$	500	Green	C
2320-4	6.5 to 25.0	$-1100 \pm 300$	300	Amber	A
2320-4SL	6.5 to 25.0	$-1100 \pm 300$	300	Amber	C
2320-10	0.6 to 2.5	$100 \pm 200$	3000	Red	B
2320-11	1.0 to 5.0	$100 \pm 200$	1000	Black	B
2320-12	2.5 to 10.0	$100 \pm 200$	1000	Blue	B
2320-13	5.0 to 18.0	$-450 \pm 300$	500	Green	B
2320-14	6.5 to 25.0	$-1100 \pm 300$	300	Amber	B

### Prototyping Kit

JMC KIT JK-023	QUANTITY	RANGE pF
2320-0	4	0.6 to 2.5
2320-1	4	1.0 to 5.0
2320-2	4	2.5 to 10
2320-3	4	5.0 to 18
2320-4	4	6.5 to 25
4192	1	Tuning Tool
	1	12mm Tape Sample

**Sealed**

**Unsealed**

**Sealed SL**

**Packaging**

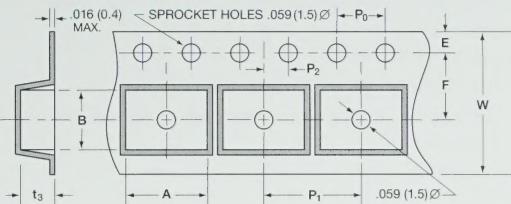
Johanson standard bulk packaging is supplied in quantities of 200 per sealed antistatic plastic bag. Standard tape and reel packaging is available in quantities of 500 or 2,500 pieces per reel.

**Carrier Tape Dimensions - Standard**


Dimensions: inches (mm)

A	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	t <sub>3</sub>
.180"	.212"	.472"	.069"	.216"	.157"	.315"	.079"	.118"

Add suffix to JMC P/N for reel packaging: **R1** = 500 pieces **R2** = 2500 pieces

**Carrier Tape Dimensions - SL**


Dimensions: inches (mm)

A	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	t <sub>3</sub>
.264"	.193"	.472"	.069"	.216"	.157"	.315"	.079"	.110"

Add suffix to JMC P/N for reel packaging: **R1** = 500 pieces **R2** = 2500 pieces

# Thin-Trim®

## Trimmer Capacitors

The Thin-Trim® 9401 series capacitors are an advanced development in miniaturized trimmers for applications in circuits where size and performance are critical. These one-half turn ceramic capacitors feature high Q performance up to 2 gigahertz and beyond.

The 9401 series construction incorporates a butterfly electrode pattern which provides a series parallel capacitor with extremely low ESR and ESL. Johanson's square drive tuning mechanism insures captive, non-slip, tamper-proof adjustments eliminating backlash problems.

### Characteristics

- Rated voltage: 250 VDC (test voltage 500 VDC)
- Insulation resistance:  $>10^4$  meg $\Omega$
- Operating temperature range:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Torque: 0.05 to 0.5 oz. in.
- Vibration: 15 g, 10-2000 Hz
- Shock: 100 g, 6 milliseconds
- Setting drift: <1%
- Moisture resistance: MIL-STD-202, Method 106
- Resistant to soldering heat: MIL-STD-202, Method 210, Test C
- Solderability: MIL-STD-202, Method 208
- Resistant to cleaning solvents: MIL-STD-202, Method 215
- Conforms with specification MIL-C-81

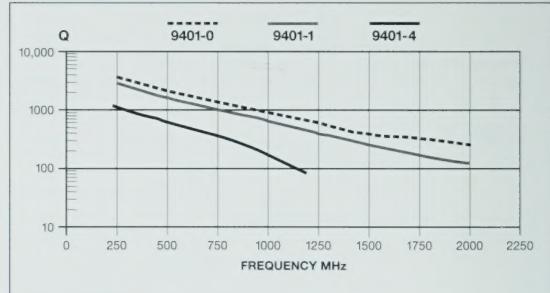
JMC Square Drive Tuning Tool 4192

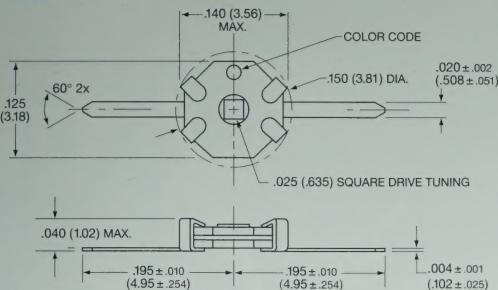


### Specifications

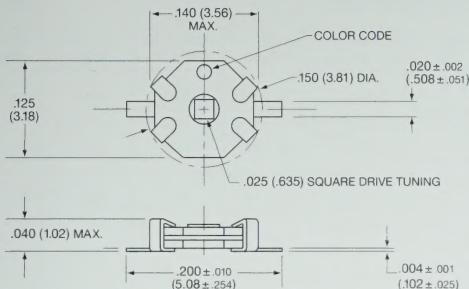
JMC P/N	RANGE pF	TC PPM/ $^{\circ}\text{C}$	MIN. Q @ 100 MHz	COLOR CODE	DRAWING FIGURE
9401-0	0.25 to 0.7	$50 \pm 50$	>1000	Red	A
9401-0SL-1	0.25 to 0.7	$50 \pm 50$	>1000	Red	B
9401-1	0.5 to 1.3	$\text{NPO} \pm 100$	>1000	Black	A
9401-1SL-1	0.5 to 1.3	$\text{NPO} \pm 100$	>1000	Black	B
9401-2	0.6 to 2.0	$-400 \pm 200$	>1000	Blue	A
9401-2SL-1	0.6 to 2.0	$-400 \pm 200$	>1000	Blue	B
9401-4	1.5 to 4.0	$-1100 \pm 300$	>500	Brown	A
9401-4SL-1	1.5 to 4.0	$-1100 \pm 300$	>500	Brown	B

### Q Performance



**9401**


Dimensions: inches (mm)

**FIGURE A**
**9401 SL - 1**


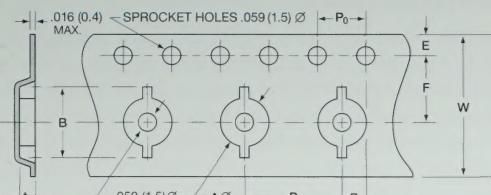
Dimensions: inches (mm)

**FIGURE B**

## Packaging

Johanson standard tape and reel packaging is available for SL products in quantities of 1,500 or 6,000 pieces per reel.

### Carrier Tape Dimensions - SL



Dimensions: inches (mm)

AØ	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	t <sub>3</sub>
157"	.230"	.472"	.069"	.216"	.157"	.315"	.079"	.051"
4.0 mm	5.85 mm	12.0 mm	1.75 mm	5.5 mm	4.0 mm	8.0 mm	2.0 mm	1.3 mm

Add suffix to JMC P/N for reel packaging: **R3** = 1500 pieces **R4** = 6000 pieces

## Prototyping Kit

JMC KIT JK-941	QUANTITY	RANGE pF
9401-0	5	0.25 to 0.7
9401-1	5	0.5 to 1.3
9401-2	5	0.6 to 2.0
9401-4	5	1.5 to 4.0
4192	1	Tuning Tool

# Thin-Trim®

## Trimmer Capacitors

Thin-Trim® capacitors are an advanced development in miniaturized trimmer capacitors for applications in circuits where size and performance are critical.

The Thin-Trim® capacitor embodies a radical reduction in size and weight over standard ceramic capacitors, with a proportional improvement in electrical characteristics. The capacitor consists of a metallic rotor suspended under spring pressure between two metalized dielectric disks. In addition to physically securing the assembly, the springs serve as both the internal electrical connection and the external terminals, simplifying the construction and further reducing size. The incorporation of the Johanson square drive tuning mechanism insures captive, non-slip, tamper-proof adjustments which are not subject to backlash problems associated with screwdriver type adjustments.

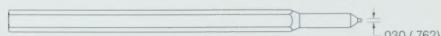
### Characteristics

- Rated voltage: 250 VDC (test voltage 500 VDC)
- Insulation resistance:  $>10^4$  meg $\Omega$
- Operating temperature range:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Torque: 0.05 to 1.0 oz. in. for 9402  
0.2 to 2.0 oz. in. for 9410
- Vibration: 15 g, 10-2000 Hz
- Shock: 100 g, 6 milliseconds
- Setting drift: <1%
- Moisture resistance: MIL-STD-202, Method 106
- Resistant to soldering heat: MIL-STD-202, Method 210, Test C
- Solderability: MIL-STD-202, Method 208
- Resistant to cleaning solvents: MIL-STD-202, Method 215
- Conforms with specification MIL-C-81

JMC Square Drive Tuning Tool 4192 for 9402



JMC Square Drive Tuning Tool 4193 for 9410



### Specifications

JMC P/N	RANGE pF	TC PPM/ $^{\circ}\text{C}$	MIN. Q @ 100 MHz	COLOR CODE	DRAWING FIGURE
9402-0	0.5 to 2.5	$100 \pm 100$	3000	Red	A
9402-OSL-1					B
9402-1	1.0 to 5.0	$100 \pm 200$	1000	Black	A
9402-1SL-1					B
9402-2	2.5 to 10.0	$-50 \pm 100$	1000	Blue	A
9402-2SL-1					B
9402-4	3.0 to 12.0	$-1100 \pm 300$	500	Brown	A
9402-4SL-1					B
9402-6	6.0 to 25.0	$-1100 \pm 300$	300	Yellow	A
9402-6SL-1					B
9402-8	5.0 to 15.0	$-300 \pm 300$	750	None	A
9402-8SL-1					B
9402-9	5.0 to 18.0	$-450 \pm 300$	500	Gray	A
9402-9SL-1					B
9410-0	1.0 to 4.5	$50 \pm 50$	1000	Red	C
9410-0SL-1					D
9410-1	2.5 to 10.0	$-100 \pm 200$	1000	Black	C
9410-1SL-1					D
9410-2	4.0 to 18.0	$-400 \pm 200$	700	Blue	C
9410-2SL-1					D
9410-3	6.0 to 35.0	$-1100 \pm 300$	200	Orange	C
9410-3SL-1					D
9410-4	7.0 to 40.0	$-1100 \pm 300$	200	Brown	C
9410-4SL-1					D
9410-5	8.0 to 50.0	$-1500 \pm 500$	200	Green	C
9410-5SL-1					D
9410-25	5.0 to 25.0	$\text{NPO} \pm 150$	200	Yellow	C
9410-25SL-1					D

## 9402

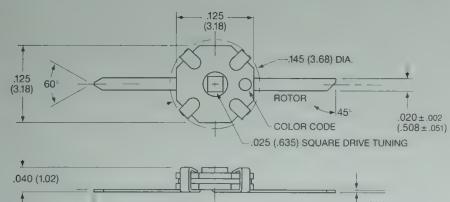


FIGURE A

## 9402 SL - 1

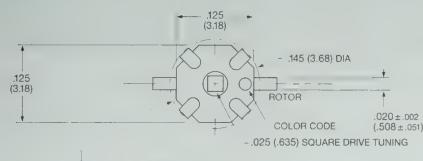


FIGURE B

## 9410

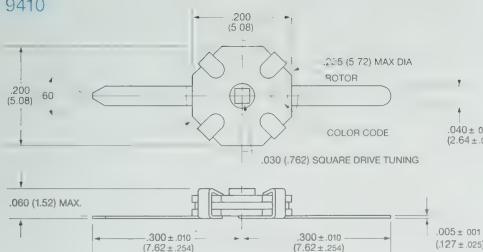


FIGURE C

## 9410 SL - 1

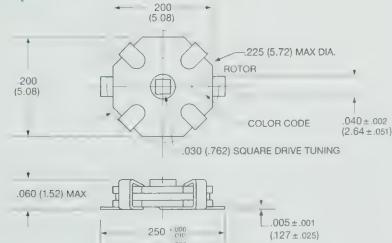
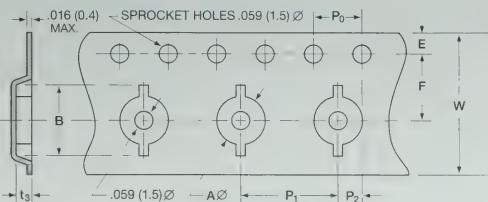


FIGURE D

## Packaging

Johanson standard tape and reel packaging is available in quantities of 1,500 or 6,000 pieces per reel for 9402 SL and 3,000 pieces per reel for 9410 SL products.

### Carrier Tape Dimensions - 9402 SL

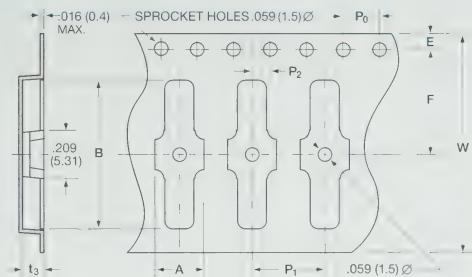


Dimensions: inches (mm)

AØ	B	W	E	F	P0	P1	P2	t3
.157"	.230"	.472"	.069"	.216"	.157"	.315"	.079"	.051"
4.0 mm	5.85 mm	12.0 mm	1.75 mm	5.5 mm	4.0 mm	8.0 mm	2.0 mm	1.3 mm

Add suffix to JMC P/N for reel packaging: **R3** = 1500 pieces **R4** = 6000 pieces

### Carrier Tape Dimensions - 9410 & 9410 SL



Dimensions: inches (mm)

A	B	W	E	F	P0	P1	P2	t3
.212"	.642"	.945"	.069"	.453"	.157"	.315"	.079"	.092"
5.38 mm	16.3 mm	24.0 mm	1.75 mm	11.5 mm	4.0 mm	8.0 mm	2.0 mm	2.35 mm

Add suffix to JMC P/N for reel packaging: **R7** = 3000 pieces

## Prototyping Kits

JMC KIT JK-942	QUANTITY	RANGE pF
9402-0	4	0.5 to 2.5
9402-1	4	1.0 to 5.0
9402-2	4	2.5 to 10
9402-6	4	6.0 to 25
9402-8	4	5.0 to 15
9402-9	4	5.0 to 20
4192	1	Tuning Tool

JMC KIT JK-940	QUANTITY	RANGE pF
9410-0	5	1.0 to 4.5
9410-1	5	2.5 to 10
9410-2	5	4.0 to 18
9410-3	5	6.0 to 35
4193	1	Tuning Tool

# Seal-Trim®

## Trimmer Capacitors

The Seal-Trim® is a high performance Thin-Trimmer® trimmer ceramic capacitor encapsulated in a polymer housing. This design resists intrusion of dirt, dust, solder flux and cleaning agents during assembly and atmospheric contamination during use. These capacitors offer low drift rates and high Q, making them ideal for higher frequency applications beyond the limits of ordinary ceramic trimmer capacitors. The incorporation of the Johanson square drive tuning mechanism insures captive non-slip, tamper-proof adjustments which are not subject to backlash problems associated with screwdriver type adjustment slots.

### Characteristics

- Rated voltage:  
250 VDC (test voltage 500 VDC) for 9610 & 9620  
400 VDC (test voltage 800 VDC) for 9694 & 9697
- Insulation resistance:  $>10^4$  megΩ
- Operating temperature range:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Torque: 0.2 to 2.0 for 9610, 9694 & 9697  
0.05 to 1.0 for 9620
- Vibration: 15 g, 10-2000 Hz, MIL-STD-202, Method 204
- Shock: 100 g, 6 milliseconds, MIL-STD-202, Method 213
- Setting drift:  $<1\%$ ;  $<2\%$  for 9616, 9694 & 9697
- Moisture resistance: MIL-STD-202, Method 106
- Resistant to soldering heat: MIL-STD-202, Method 210, Test C
- Solderability: MIL-STD-202, Method 208
- Resistant to cleaning solvents: MIL-STD-202, Method 215
- Conforms with specification MIL-C-81

JMC Tuning Tool 2190 for 9690



JMC Tuning Tool 4192 for 9620



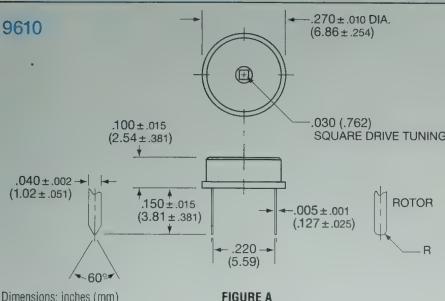
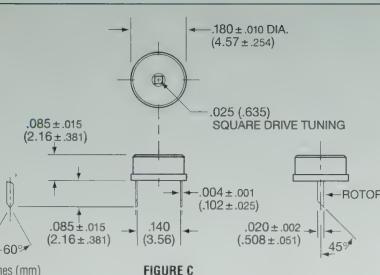
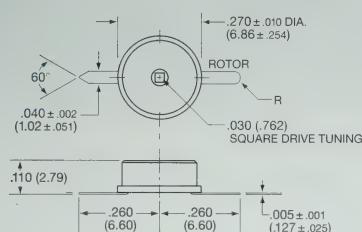
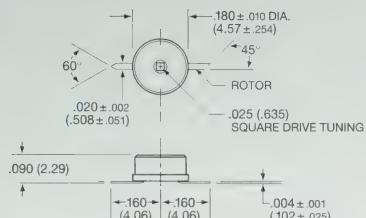
JMC Tuning Tool 4193 for 9610



### Specifications

JMC P/N	MIL-SPEC P/N	RANGE pF	TC PPM/°C	MIN. Q @ 100 MHz	DRAWING FIGURE
9610	—				A
9610CV	CV99L4R5	1.0 to 4.5	50 $\pm$ 150	>1000	A
9610SL	—				B
9610SLCV	CV99L4R5SL				B
9611	—				A
9611CV	CV99M100	2.5 to 10.0	-100 $\pm$ 500	>1000	A
9611SL	—				B
9611SLCV	CV99M100SL				B
9612	—				A
9612CV	CV99N180	4.0 to 18.0	-300 $\pm$ 800	>700	A
9612SL	—				B
9612SLCV	CV99N180SL				B
9613	—				A
9613CV	CV99Q350	6.0 to 35.0	-1500 $\pm$ 900	>200	A
9613SL	—				B
9613SLCV	CV99Q350SL				B
9614	—				A
9614CV	CV99Q400	7.0 to 40.0	-1500 $\pm$ 900	>200	A
9614SL	—				B
9614SLCV	CV99Q400SL				B
9615	—				A
9615CV	CV99P250	5.0 to 25.0	-400 $\pm$ 500	>200	A
9615SL	—				B
9615SLCV	CV99P250SL				B
9616	—				A
9616CV	CV99Q500	8.0 to 50.0	-1500 $\pm$ 900	>200	A
9616SL	—				B
9616SLCV	CV99Q500SL				B

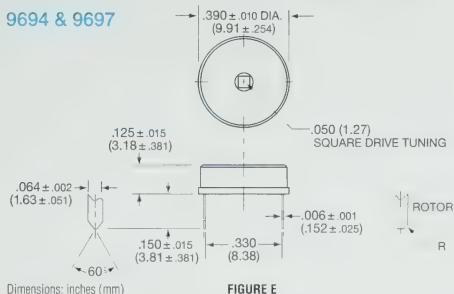
Suffix CV designates MIL-SPEC products

**9610**

**9620**

**9610 SL**

**9620 SL**


## Specifications

JMC P/N	MIL-SPEC P/N	RANGE pF	TC PPM/°C	MIN. Q @ 100 MHz	DRAWING FIGURE
9620	—				C
9620CV	CV98F2R5	0.5 to 2.5	100 ± 150	>1000	C
9620SL	—				D
9620SLCV	CV98F2R5SL				D
9621	—				C
9621CV	CV98W5R0	1.0 to 5.0	0 ± 400	>1000	C
9621SL	—				D
9621SLCV	CV98W5R0SL				D
9622	—				C
9622CV	CV98H100	2.5 to 10.0	100 ± 600	>1000	C
9622SL	—				D
9622SLCV	CV98H100SL				D
9626	—				C
9626CV	CV98Q250	6.0 to 25.0	-1500 ± 900	>300	C
9626SL	—				D
9626SLCV	CV98Q250SL				D
9628	—				C
9628CV	CV98J150	5.0 to 15.0	-300 ± 300	>750	C
9628SL	—				D
9629	CV98K200				C
9629CV	—	5.0 to 20.0	-450 ± 300	>500	C
9629SL	—				D
9694	—	7.5 to 50.0	-1500 ± 900	>1000 @ 1 MHz	E
9697	—	20.0 to 100			E

 Suffix **CV** designates MIL-SPEC products.

**9694 & 9697**


## Prototyping Kits

JMC KIT JK-960	QUANTITY	RANGE pF
9610	3	1.0 to 4.5
9611	3	2.5 to 10
9612	3	4.0 to 18
9613	3	6.0 to 35
9614	3	7.0 to 40
9615	3	5.0 to 25
4193	1	Tuning Tool

JMC KIT JK-962	QUANTITY	RANGE pF
9620	4	0.5 to 2.5
9621	4	1.0 to 5.0
9622	4	2.5 to 10
9629	4	5.0 to 20
4192	1	Tuning Tool

JMC KIT JK-969	QUANTITY	RANGE pF
9694	4	7.5 to 50
9697	4	20.0 to 100
2190	1	Tuning Tool

# Ceramic

## Trimmer Capacitors

These ceramic trimmer capacitors are designed for broadband applications from audio to 500 MHz and afford an ideal low cost means of trimming circuitry such as crystal oscillators, CATV amplifiers and all varieties of communication and test equipment.

These trimmers are available in three mounting styles for printed circuits with top tuning capability.

### Characteristics

- Rated voltage: 250 VDC (test voltage 500 VDC)
- Insulation resistance:  $>10^4$  meg $\Omega$
- Operating temperature range:  $-55^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Vibration: 15 g, 10-2000 Hz, MIL-STD-202, Method 204
- Shock: 100 g, 6 milliseconds, MIL-STD-202, Method 213
- Conforms with specification MIL-C-811

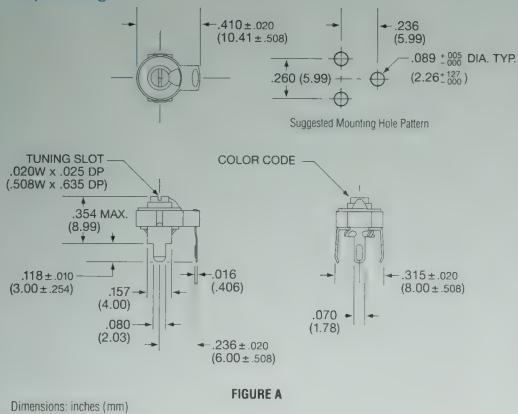
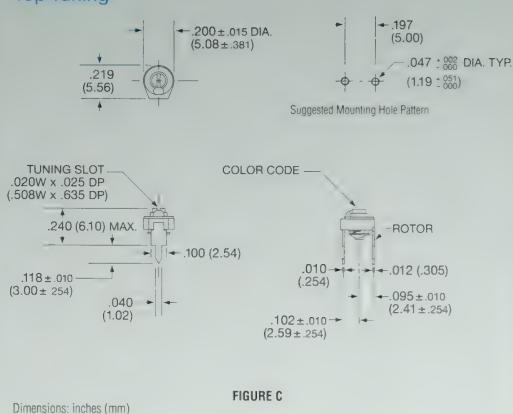
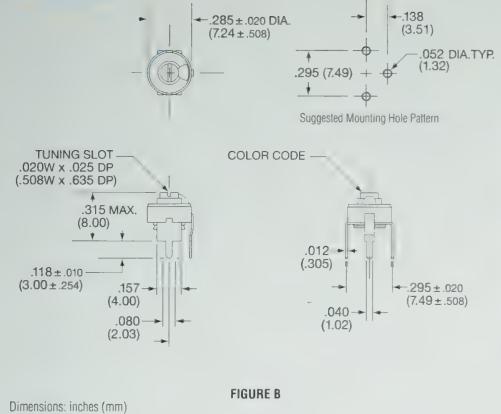
JMC Tuning Tool 8777



Figure A  
Actual  
Size

### Specifications

JMC P/N	RANGE pF	TC PPM/ $^{\circ}\text{C}$	MIN. Q @ 10 MHz	TORQUE OZ. IN.	COLOR CODE	DRAWING FIGURE
9300	2.8 to 8.0	NPO $\pm$ 200	>300	0.56 to 5.6	Red	A
9301	2.0 to 12.0	NPO $\pm$ 200	>300	0.56 to 5.6	None	A
9302	2.5 to 23.0	-450 $\pm$ 200	>300	0.56 to 5.6	Blue	A
9303	4.0 to 34.0	550 $\pm$ 800	>300	0.56 to 5.6	Orange	A
9304	5.5 to 45.0	-1400 $\pm$ 800	>200	0.56 to 5.6	Brown	A
9305	6.0 to 55.0	-1400 $\pm$ 800	>200	0.56 to 5.6	Green	A
9314	6.0 to 60.0	-1400 $\pm$ 800	>200	0.56 to 5.6	Pink	A
9315	6.0 to 70.0	-1400 $\pm$ 800	>200	0.56 to 5.6	Gray	A
9328	12.0 to 100	-1400 $\pm$ 800	>200 @ 1MHz	0.56 to 5.6	White	A
9306	2.0 to 8.0	NPO $\pm$ 200	>300	0.56 to 5.6	Red	B
9307	2.0 to 12.0	NPO $\pm$ 200	>300	0.56 to 5.6	None	B
9308	2.5 to 23.0	-450 $\pm$ 200	>300	0.56 to 5.6	Blue	B
9309	4.0 to 34.0	-500 $\pm$ 800	>300	0.56 to 5.6	Orange	B
9310	5.5 to 45.0	-1400 $\pm$ 800	>200	0.56 to 5.6	Brown	B
9311	6.0 to 55.0	-1400 $\pm$ 800	>200	0.56 to 5.6	Green	B
9371	1.8 to 5.0	NPO $\pm$ 250	>300	0.3 to 3.0	Black	C
9372	3.0 to 10.0	-600 $\pm$ 300	>300	0.3 to 3.0	None	C
9373	3.5 to 18.0	-800 $\pm$ 300	>300	0.3 to 3.0	Blue	C
9374	5.0 to 25.0	-1500 $\pm$ 500	>200	0.3 to 3.0	Purple	C
9376	9.0 to 50	-1500 $\pm$ 500	>200 @ 1MHz	0.3 to 3.0	Green	C

**Top Tuning**

**FIGURE A**
**Top Tuning**

**FIGURE C**
**Top Tuning**

**FIGURE B**
**Prototyping Kit**

JMC KIT JK-930	QUANTITY	RANGE pF
9308	5	2.5 to 23
9309	5	4.0 to 34
9310	5	5.5 to 45
9372	10	3.0 to 10
9374	10	5.0 to 25
8777	1	Tuning Tool

# Ceramic Chip

## Trimmer Capacitors

The 9342 trimmers are single turn, ceramic dielectric capacitors featuring a silicone seal which allows stringent washing. These trimmers are extremely small measuring only 0.120" L x 0.10" W x 0.05" H. Their construction enables them to be used in conjunction with reflow soldering assembly techniques.

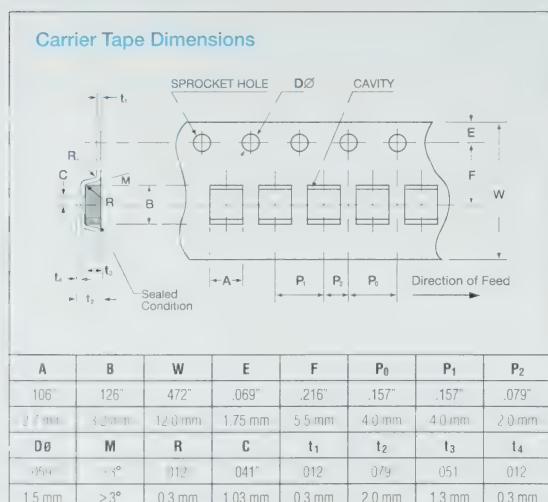
### Characteristics

- Rated voltage: 50 VDC (test voltage 100 VDC)
- Insulation resistance:  $>10^4$  meg $\Omega$
- Operating temperature range:  $-25^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Torque: 0.14 to 2.1 oz. in.
- Washable construction

JMC Slot Tuning Tool: Please consult factory.

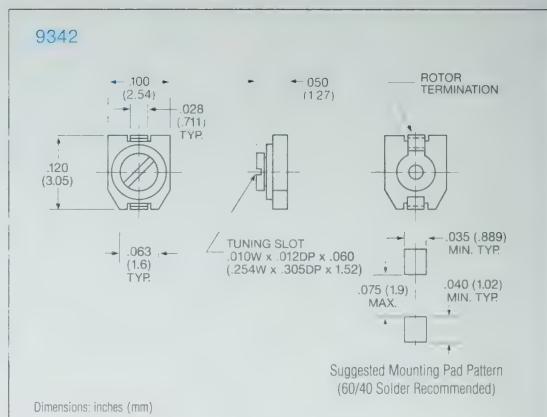
### Packaging

9342 series is only available on tape and reel in quantities of 2,000 pieces per reel.



### Prototyping Kit (9342 and 9343 Series)

JMC KIT JK-342	QUANTITY	RANGE pF
9342-2R8	5	2.5 to 5.0
9342-4R8	5	3.0 to 10
9342-6R8	5	5.0 to 20
9343-1R9	5	1.0 to 3.0
9343-4R9	5	1.5 to 10
9343-9R9	5	5.0 to 40
8762	1	Tuning Tool



### Specifications

JMC P/N	RANGE pF	TC PPM/°C	MIN. Q @ 1 MHz
9342-1R8	2.0 to 3.0	NPO $\pm$ 500	150
9342-2R8	2.5 to 5.0	N750 $\pm$ 500	150
9342-3R8	3.0 to 5.0	NPO $\pm$ 500	150
9342-4R8	3.0 to 10.0	NPO $\pm$ 500	150
9342-5R8	5.0 to 10.0	N750 $\pm$ 500	150
9342-6R8	5.0 to 20.0	N750 $\pm$ 500	150

# Ceramic Chip Trimmer Capacitors

The 9343 series of surface mount trimmer capacitors offers a wide range of capacitance values in an extremely small size. The unique design allows them to be used in applications where reflow soldering is part of the manufacturing procedure.

The 9343 series is 0.177" L x 0.125" W x 0.070" H.

## Characteristics

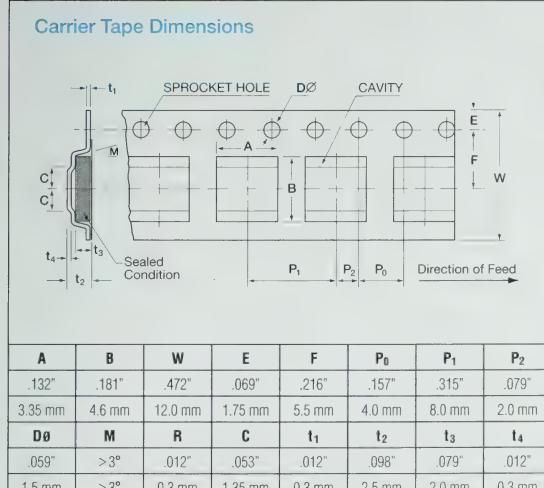
- Rated voltage: 50 VDC (test voltage 100 VDC)
- Insulation resistance:  $>10^4$  meg $\Omega$
- Operating temperature range:  $-25^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Torque: 0.14 to 2.1 oz. in.
- Washable construction

JMC Slot Tuning Tool 8766



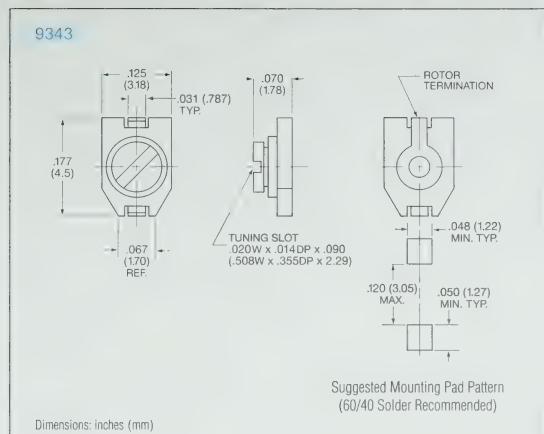
## Packaging

9343 series is only available on tape and reel in quantities of 1,000 pieces per reel.



## Prototyping Kit (9342 and 9343 Series)

JMC KIT JK-342	QUANTITY	RANGE pF
9342-2R8	5	2.5 to 5.0
9342-4R8	5	3.0 to 10
9342-6R8	5	5.0 to 20
9343-1R9	5	1.0 to 3.0
9343-4R9	5	1.5 to 10
9343-9R9	5	5.0 to 40
8777	1	Tuning Tool



## Specifications

JMC P/N	RANGE pF	TC PPM/°C	MIN. Q @ 1 MHz
9343-1R9	1.0 to 3.0	NPO $\pm$ 500	300
9343-2R9	1.5 to 5.0	NPO $\pm$ 500	300
9343-3R9	2.0 to 5.0	N750 $\pm$ 500	300
9343-4R9	1.5 to 10.0	N400 $\pm$ 500	300
9343-5R9	2.5 to 10.0	NPO $\pm$ 500	300
9343-6R9	3.0 to 10.0	N750 $\pm$ 500	300
9343-7R9	5.0 to 20.0	N750 $\pm$ 500	300
9343-8R9	5.0 to 30.0	N750 $\pm$ 500	300
9343-9R9	5.0 to 40.0	N750 $\pm$ 500	300

# Tiny-Trim®

## Trimmer Capacitors

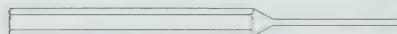
The 9341 and 9349 series are among the smallest trimmer capacitors available. Their unique design offers a wide range of capacitance values, and both series are ideal for applications where extremely small size is a design criteria.

The 9341 series capacitors have a diameter of 0.120" and a height of 0.070" and incorporate silver-plated ribbon leads. The 9349 series capacitors have a diameter of 0.090" and a height of 0.047" and incorporate gold-plated ribbon leads.

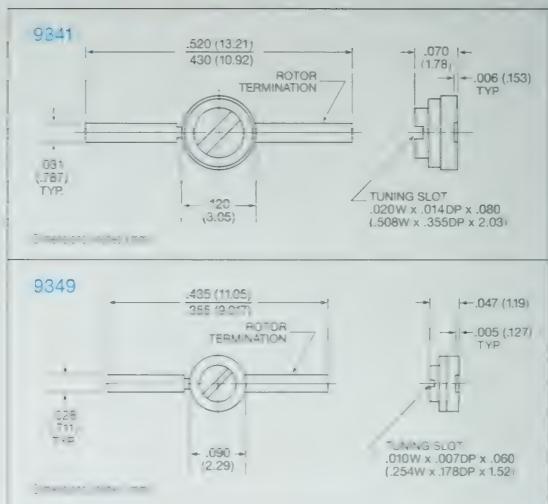
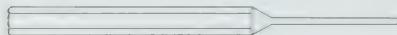
### Characteristics

- Rated voltage: 50 VDC (test voltage 100 VDC)
- Insulation resistance:  $>10^4$  meg $\Omega$
- Operating temperature range:  $-25^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Torque: 0.14 to 1.0 oz. in.

JMC Slot Tuning Tool 8766 for 9341 Series



JMC Slot Tuning Tool 8762 for 9349 Series



### Specifications

JMC P/N	RANGE pF	TC PPM/°C	MIN. Q @ 1 MHz
9341-1SL	1.0 to 3.0	NPO $\pm$ 300	200
9341-2SL	1.5 to 5.0	NPO $\pm$ 300	200
9341-3SL	1.5 to 10.0	N400 $\pm$ 300	200
9341-4SL	1.5 to 15.0	N400 $\pm$ 500	200
9341-5SL	3.0 to 20.0	N400 $\pm$ 500	200
9341-6SL	5.0 to 25.0	N750 $\pm$ 500	200
9341-7SL	5.0 to 30.0	N750 $\pm$ 500	200
9341-8SL	6.0 to 35.0	N750 $\pm$ 500	200
9341-9SL	6.0 to 40.0	N750 $\pm$ 500	200
9349-1SL	5.0 to 15.0	N1000 $\pm$ 600	100
9349-2SL	5.0 to 20.0	N1000 $\pm$ 800	100

# Ceramic

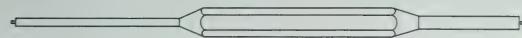
## Trimmer Capacitors

The 9385 ceramic trimmer offers the advantages of high frequency operation, miniature size and remarkable cost effectiveness. The 9385 incorporates rugged construction in both its standard printed circuit and SL mounting configurations.

### Characteristics

- Rated voltage: 50 VDC (test voltage 110 VDC)
- Insulation resistance:  $>10^4$  meg  $\Omega$
- Operating temperature range:  $-30^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Torque: 0.3 to 3.0 oz. in.

### JMC Slot Tuning Tool 8777



### Specifications

JMC P/N	RANGE pF	TC PPM/ $^{\circ}\text{C}$	MIN. Q @ 10 MHz	COLOR CODE	DRAWING FIGURE
9385-1PC	1.2 to 3.0	$-100 \pm 250$	$>500$	Black	A
9385-1SL	1.2 to 3.0	$-100 \pm 250$	$>500$	Black	B
9385-2PC	1.4 to 5.0	$-250 \pm 250$	$>500$	Red	A
9385-2SL	1.4 to 5.0	$-250 \pm 250$	$>500$	Red	B
9385-3PC	1.8 to 9.0	$-550 \pm 300$	$>300$	None	A
9385-3SL	1.8 to 9.0	$-550 \pm 300$	$>300$	None	B
9385-4PC	2.8 to 18.0	$-550 \pm 300$	$>300$	Blue	A
9385-4SL	2.8 to 18.0	$-550 \pm 300$	$>300$	Blue	B
9385-5PC	4.0 to 28.0	$-1200 \pm 500$	$>200$	Yellow	A
9385-5SL	4.0 to 28.0	$-1200 \pm 500$	$>200$	Yellow	B

### Prototyping Kit

JMC KIT JK-935	QUANTITY	RANGE pF
9385-1PC	5	1.2 to 3.0
9385-2PC	5	1.4 to 5.0
9385-3PC	5	1.8 to 9.0
9385-4PC	5	2.8 to 18.0
9385-5PC	5	4.0 to 28.0
8777	1	Tuning Tool



9385 PC

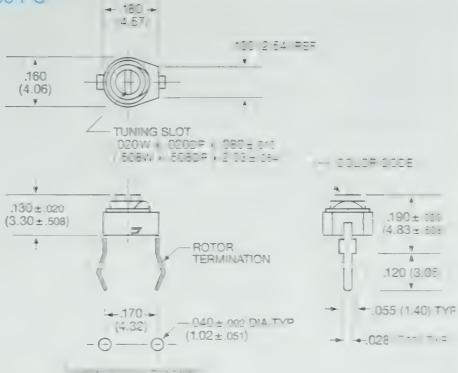
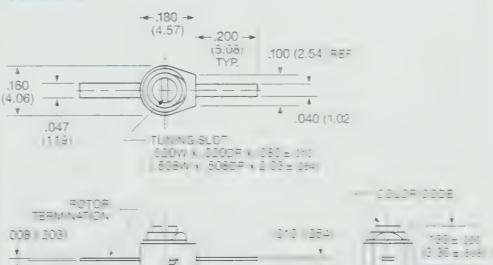


FIGURE A

9385 SL



Dimensions: inches (mm)

FIGURE B

# Ceramic

## Trimmer Capacitors

The 9387 snap-in, flux resistant trimmer is an extremely cost effective device which has been designed specifically for cost sensitive applications where automatic tuning capability is a requirement.

### Characteristics

- Rated voltage: 50 VDC (test voltage 110 VDC)
- Insulation resistance:  $>10^4$  meg  $\Omega$
- Operating temperature range:  $-30^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Torque: 0.3 to 3.0 oz. in.

JMC Tuning Tool 8777

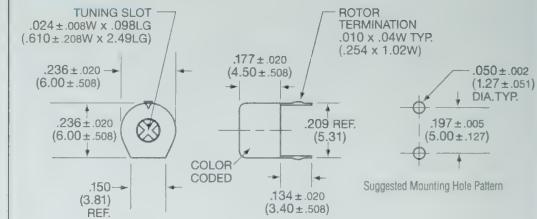


### Prototyping Kit

JMC KIT JK-387	QUANTITY	RANGE pF
9387-2PC	3	2.0 to 5.0
9387-3PC	3	3.0 to 10
9387-4PC	3	4.2 to 20
9387-5PC	3	6.2 to 30
9387-7PC	3	6.8 to 40
9387-8PC	3	10.2 to 60
8777	1	Tuning Tool



9387 PC



Dimensions: inches (mm)

### Specifications

JMC P/N	RANGE pF	TC PPM/°C	MIN. Q @ 1 MHz	COLOR CODE
9387-2PC	2.0 to 5.0	NPO ± 200	>500	Blue
9387-3PC	3.0 to 10.0	N470 ± 300	>500	White
9387-4PC	4.2 to 20.0	N750 ± 300	>500	Red
9387-5PC	6.2 to 30.0	N750 ± 300	>500	Green
9387-6PC	9.8 to 50.0	N1200 ± 500	>300	Brown
9387-7PC	6.8 to 40.0	N1200 ± 500	>300	Yellow
9387-8PC	10.2 to 60.0	N1200 ± 500	>200	Brown



## 2400 Series Kit

JMC KIT JK-024	QUANTITY	RANGE pF
2400-0	4	0.7 to 2.0
2400-1	4	1.5 to 4.0
2400-2	4	3.0 to 9.0
2400-3	4	4.0 to 13
4192	1	Tuning Tool
	1	12mm Tape Sample

## 2320 Series Kit

JMC KIT JK-023	QUANTITY	RANGE pF
2320-0	4	0.6 to 2.5
2320-1	4	1.0 to 5.0
2320-2	4	2.5 to 10
2320-3	4	5.0 to 18
2320-4	4	6.5 to 25
4192	1	Tuning Tool
	1	12mm Tape Sample

## 9401 Series Kit

JMC KIT JK-941	QUANTITY	RANGE pF
9401-0	5	0.25 to 0.7
9401-1	5	0.5 to 1.3
9401-2	5	0.6 to 2.0
9401-4	5	1.5 to 4.0
4192	1	Tuning Tool

## 9402 and 9410 Series Kits

JMC KIT JK-942	QUANTITY	RANGE pF
9402-0	4	0.5 to 2.5
9402-1	4	1.0 to 5.0
9402-2	4	2.5 to 10
9402-6	4	6.0 to 25
9402-8	4	5.0 to 15
9402-9	4	5.0 to 18
4192	1	Tuning Tool

JMC KIT JK-940	QUANTITY	RANGE pF
9410-0	5	1.0 to 4.5
9410-1	5	2.5 to 10
9410-2	5	4.0 to 18
9410-3	5	6.0 to 35
4193	1	Tuning Tool

## 9600 Series Kits

JMC KIT JK-960	QUANTITY	RANGE pF
9610	3	1.0 to 4.5
9611	3	2.5 to 10
9612	3	4.0 to 18
9613	3	6.0 to 35
9614	3	7.0 to 40
9615	3	5.0 to 25
4193	1	Tuning Tool

JMC KIT JK-962	QUANTITY	RANGE pF
9620	4	0.5 to 2.5
9621	4	1.0 to 5.0
9622	4	2.5 to 10
9629	4	5.0 to 20
4192	1	Tuning Tool

JMC KIT JK-969	QUANTITY	RANGE pF
9694	4	7.5 to 50
9697	4	20.0 to 100
2190	1	Tuning Tool

## 9300 Series Kit

JMC KIT JK-930	QUANTITY	RANGE pF
9308	5	2.5 to 23
9309	5	4.0 to 34
9310	5	5.5 to 45
9372	10	3.0 to 10
9374	10	5.0 to 25
9373	3	3.5 to 18
8777	1	Tuning Tool

## 9342 and 9343 Series Kit

JMC KIT JK-342	QUANTITY	RANGE pF
9342-2R8	5	2.5 to 5.0
9342-4R8	5	3.0 to 10
9342-6R8	5	5.0 to 20
9343-1R9	5	1.0 to 3.0
9343-4R9	5	1.5 to 10
9343-9R9	5	5.0 to 40
8777	1	Tuning Tool

## 9385 Series Kit

JMC KIT JK-935	QUANTITY	RANGE pF
9385-1PC	5	1.2 to 3.0
9385-2PC	5	1.4 to 5.0
9385-3PC	5	1.8 to 9.0
9385-4PC	5	2.8 to 18
9385-5PC	5	4.0 to 28
8777	1	Tuning Tool

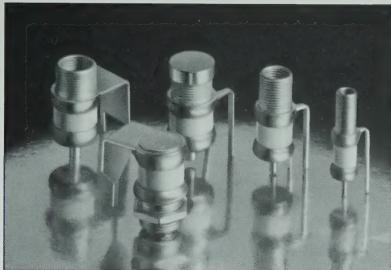
## 9387 Series Kit

JMC KIT JK-387	QUANTITY	RANGE pF
9387-2PC	3	2.0 to 5.0
9387-3PC	3	3.0 to 10
9387-4PC	3	4.2 to 20
9387-5PC	3	6.2 to 30
9387-7PC	3	6.8 to 40
9387-8PC	3	10.2 to 60
8777	1	Tuning Tool

JMC Part Number	Page						
2320-0	4	9342-1R8	14	9401-0	6	9612	10
2320-0SL	4	9342-2R8	14	9401-0SL-1	6	9612CV	10
2320-1	4	9342-3R8	14	9401-1	6	9612SL	10
2320-1SL	4	9342-4R8	14	9401-1SL-1	6	9612SLCV	10
2320-2	4	9342-5R8	14	9401-2	6	9613	10
2320-2SL	4	9342-6R8	14	9401-2SL-1	6	9613CV	10
2320-3	4			9401-4	6	9613SL	10
2320-3SL	4	9343-1R9	15	9401-4SL-1	6	9613SLCV	10
2320-4	4	9343-2R9	15	9402-0	8	9614CV	10
2320-4SL	4	9343-3R9	15	9402-0SL-1	8	9614SL	10
2320-10	4	9343-4R9	15	9402-1	8	9614SLCV	10
2320-11	4	9343-5R9	15	9402-1SL-1	8	9615	10
2320-12	4	9343-6R9	15	9402-2	8	9615CV	10
2320-13	4	9343-7R9	15	9402-2SL-1	8	9615SL	10
2320-14	4	9343-8R9	15	9402-4	8	9615SLCV	10
		9343-9R9	15	9402-4SL-1	8	9616	10
2400-0	3			9402-6	8	9616CV	10
2400-1	3	9349-1SL	16	9402-6SL-1	8	9616SL	10
2400-2	3	9349-2SL	16	9402-8	8	9616SLCV	10
2400-3	3			9402-8SL-1	8		
9300	12	9371	12	9402-9	8	9620	11
9301	12	9372	12	9402-9SL-1	8	9620CV	11
9302	12	9373	12			9620SL	11
9303	12	9374	12			9620SLCV	11
9304	12	9376	12	9410-0	8		
9305	12	9385-1PC	17	9410-1	8	9621CV	11
9306	12	9385-1SL	17	9410-1SL-1	8	9621SL	11
9307	12	9385-2PC	17	9410-2	8	9621SLCV	11
9308	12	9385-2SL	17	9410-2SL-1	8	9622	11
9309	12	9385-3PC	17	9410-3	8	9622CV	11
9310	12	9385-3SL	17	9410-3SL-1	8	9622SL	11
9311	12	9385-4PC	17	9410-4	8	9622SLCV	11
9314	12	9385-4SL	17	9410-4SL-1	8	9626	11
9315	12	9385-5PC	17	9410-5	8	9626CV	11
9328	12	9385-5SL	17	9410-5SL-1	8	9626SL	11
				9410-25	8	9626SLCV	11
9341-1SL	16	9387-2PC	18	9410-25SL-1	8	9628	11
9341-2SL	16	9387-3PC	18			9628CV	11
9341-3SL	16	9387-4PC	18	9610	10	9628SL	11
9341-4SL	16	9387-5PC	18	9610CV	10	9629	11
9341-5SL	16	9387-6PC	18	9610SL	10	9629CV	11
9341-6SL	16	9387-7PC	18	9610SLCV	10	9629SL	11
9341-7SL	16	9387-8PC	18	9611	10	9694	11
9341-8SL	16			9611CV	10	9697	11
9341-9SL	16			9611SL	10		
				9611SLCV	10		

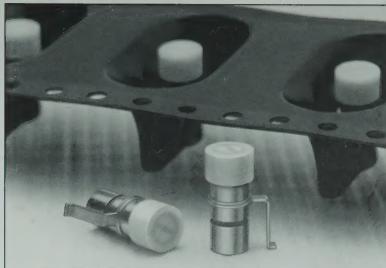


Johanson Manufacturing Corporation designs and manufactures other types of capacitors and related products.



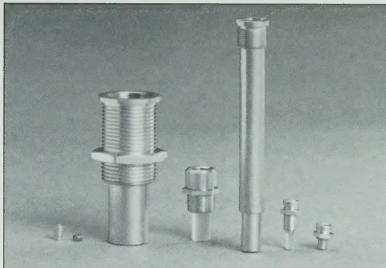
#### Air Capacitors

The industry standard of excellence. Available in a variety of sizes and mounting configurations incorporating a one piece, self-locking, constant torque drive mechanism.



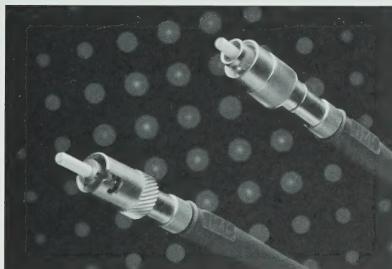
#### Giga-Trim® Capacitors

These gigahertz trimmers are miniature capacitors designed for fine tuning RF and microwave circuits. Available in a wide range of mounting styles.



#### Microwave Tuning Elements

Microwave tuning elements are an economical means of introducing a variable reactance to waveguides, cavities and other microwave structures.



#### Fiber Optic Products

Johanson's many years of experience in designing and manufacturing miniature precision electronic products assures the fiber optic system the same Johanson quality.



If your design requirements incorporate these products, we invite you to contact Johanson Manufacturing Corporation for detailed information. Telephone 201-334-2676 Fax 201-334-2954



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